
In the
United States Court of Appeals
For the Ninth Circuit

THE PARKER APPLIANCE COMPANY,
Plaintiff-Appellant,

vs.

IRVIN W. MASTERS, INC.,

and

JOSEPH C. COLLINS, doing business as
COLLINS ENGINEERING CO.,
Defendants-Appellees.

} Appeal No. 12,848

APPELLANT'S OPENING BRIEF.

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INDEX.

| | PAGE |
|---|------|
| Jurisdiction | 1 |
| Statement of the Case | 2 |
| The Parties | 2 |
| The Accused Structures | 3 |
| Parker Patent No. 2,212,183 | 7 |
| When the Parker Coupling Is Drawn Tight, the Sleeve Head Angle Is Reduced in Magnitude by Sleeve Flexure and the Differential Angle Dis- appears Because of Sleeve Flexure and De- formation of the Tubing Flare..... | 11 |
| The Parker Patent Coupling Has Enjoyed Unqual- ified Commercial Success | 13 |
| The Decision Below | 14 |
| Specification of Errors | 14 |
| Argument on Invention | 17 |
| It Is Undisputed on the Record that the Sleeve Head Angle and the Differential Angle Were Wholly New With Parker | 18 |
| A Patent Is Presumed To Be Valid. The Pre- sumption Is Especially Strong Where, as Here, the Subject Matter of the Invention Is New | 20 |
| The Parker Coupling Was Developed After Many Efforts in the Aircraft Industry to Obtain a Sat- isfactory Coupling for Flared Tubes. It Re- placed All the Prior Art Constructions..... | 23 |
| The Army and Navy, After Searching for a Non- Proprietary Coupling, Nevertheless Standard- ized on the Parker Patented Couplings | 26 |

| | |
|---|----|
| The Parker Coupling Was Disclosed to the Trade in 1940. In the Decade Since that Time No Superior Fitting Has Been Developed | 29 |
| The Parker Coupling Has Met, to the Exclusion of Other Couplings, the Demands of the Aircraft Industry. These Demands Are Exceedingly Severe | 30 |
| The Sleeve Head Angle, New With Parker, Gives Rise to Hoop Tension in the Sleeve Head to Minimize Nut Jamming. At the Same Time the Sleeve Head Angle Prevents Loosening of the Coupling Under Vibration | 33 |
| The Parker Differential Angle Provides an Initial Toe Contact That Not Only Cooperates With the Sleeve Head Angle to Facilitate Sleeve Flexure But Also Independently Aids in Effecting a Tight Secure Seal | 37 |
| Simplicity Is Not the Test of Invention. Parker Cannot Be Denied the Status of Inventor Because His Changes in Retrospect Seem Simple.. | 38 |
| The District Court Misconstrued the Issue of Validity in Holding That Validity "Depends Upon the Sleeve" | 40 |
| Conclusion On Invention | 41 |
| Argument on Claim Language | 41 |
| Section 4888 R. S. Requires Only That a Patentee "Distinctly" Claim the Invention—Not That Each Claim Must be a Textbook on the Invention | 42 |
| There Is No Record Evidence That the Parker Specification Is Incomplete. Nothing Overcomes the Examiner's Finding That the Specification Adequately Describes the Parker Coupling.... | 43 |

| | |
|---|----|
| Each Claim of the Parker Patent “Particularly Points Out and Distinctly Claims” the Parker Invention. The Statute Requires Nothing More | 45 |
| The Courts Have Uniformly Held That Claims Need Only Point Out the Invention—Not Re- describe It | 48 |
| Without Exception, the Decided Cases Hold That Claims Like Parker’s Are Proper | 50 |
| The Incandescent Lamp Case, Erroneously and Gratuitously Relied Upon Below, Is Wholly Ir- relevant to Any Issue of This Case | 52 |
| The Parts of the Parker Patent Structure Coact in a New Manner to Form a New Combination Not Shown in the Prior Art. <i>Halliburton v.</i> <i>Walker</i> Is Inapplicable | 54 |
| The Claim in <i>General Electric v. Wabash</i> Was Merely to a Result. The Parker Patent Claims Structure. <i>General Electric</i> Does Not Apply... | 55 |
| Conclusion On Claim Language | 56 |
| Argument on Infringement | 57 |
| Each and Every Element of the Parker Claims Finds Response in the Accused Structures.... | 57 |
| Conclusion | 58 |

TABLE OF AUTHORITIES.

Cases.

| | |
|--|--------------------|
| Bianchi v. Barili, 168 F. (2d) 793 (C. A. 9, 1948) | 23, 39 |
| Continental Paper Bag Co. v. Eastern Paper Bag Co., 210 U. S. 405 (1909) | 16, 51 |
| Cutter Laboratories v. Lyophile-Cryochem, 179 F. (2d) 80 (C. A. 9, 1949) | 17, 51, 52, 55 |
| Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U. S. 45 (1923) | 25, 26 |
| Faulkner v. Gibbs, 338 U. S. 267 (1949) | 55 |
| General Electric Company v. Wabash Appliance Corp., 304 U. S. 364 (1938) | 17, 55, 56 |
| Goodyear Tire & Rubber Co., Inc., et al. v. Ray-O-Vac Co., 321 U. S. 275 (1944) | 25, 26, 39 |
| Halliburton Oil Well Cementing Co. v. Walker, et al., 329 U. S. 1 (1946) | 16, 54, 55 |
| Hildreth v. Mastoras, 257 U. S. 27 (1921) | 24, 26 |
| Incandescent Lamp Patent Case, 159 U. S. 465 (1895) | 16, 52, 53, 56 |
| Lincoln Engineering v. Stewart-Warner, 303 U. S. 545 (1938) | 43 |
| Loom Co. v. Higgins, 105 U. S. 580 (1882) | 39 |
| Mumm v. Jacob E. Decker & Sons, 301 U. S. 168 (1937) | 20, 45 |
| Payne Furnace Co. v. Williams-Wallace Co., 117 F. (2d) 823 (C. A. 9, 1941) | 23, 29, 30, 48, 50 |
| Chas. Peckat Mfg. Co. v. Jacobs, 178 F. (2d) 794 (C. A. 7, 1949) | 17, 49 |

| | |
|---|--------|
| Sales Affiliates, Inc. v. Hutzler Bros. Co., 71 F. Supp. 287 (D. Md. 1947) | 16 |
| Schreyer v. Chicago Motocoil Corp., 118 F. (2d) 852 (C. A. 7, 1941) | 51 |
| Shull Perforating Co., Inc. v. Cavins, 94 F. (2d) 357 (C. A. 9, 1938) | 50 |
| Smith v. Snow, 294 U. S. 1 (1935) | 48 |
| Snow v. Kellar-Thomason Co., 241 Fed. 119 (C. A. 9, 1917) | 53 |
| Western States Mach. Co. v. Hepworth, 147 F. (2d) 345 (C. A. 2, 1945) | 45, 48 |
| Yale Lock Co. v. Greenlaw, 117 U. S. 554 (1886) | 16 |

Statutes.

| | |
|---|----------------|
| 35 U. S. C. 33, Section 4888 R. S. | 17, 42, 45, 59 |
|---|----------------|

Other Authorities.

| | |
|--|----|
| 69 C. J. S. 701 | 48 |
| Manual of Patent Examining Procedure | 43 |

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APPELLANT'S OPENING BRIEF.

This is an appeal from the judgment of Judge Westover dismissing an action for patent infringement brought by Plaintiff-Appellant against Defendants-Appellees (R. 89-91). Judgment was entered on an opinion and findings that Parker Patent No. 2,212,183* is invalid (R. 65-88).

Jurisdiction.

This suit arises under the patent laws. Jurisdiction of the District Court is founded upon 28 U. S. C. 1338. Appellate jurisdiction of this Court is based on 28 U. S. C.

* Hereafter referred to as the Parker patent. Couplings embodying the invention are referred to as Parker Couplings.

1291. Judgment was entered by the District Court on December 8, 1950. This appeal was taken on January 2, 1951, within the statutory period.

STATEMENT OF THE CASE.

Parker patent No. 2,212,183, and the present suit, relate to couplings or fittings used to connect detachably the flared ends of thin-walled metal tubes used to convey liquids and gases in airplanes, automatic machine tools, and other structures. These couplings are used in great numbers to connect the tubes forming the hydraulic, fuel, air, oxygen and like fluid systems in modern aircraft (R. 930-934). Approximately 6,000 of these couplings are used in a large commercial airplane (R. 1052).

The Parties.

Plaintiff-Appellant, The Parker Appliance Company, is assignee of the Parker patent in suit (Complaint paragraph 6, R. 5; admitted, R. 10). Plaintiff also manufactures and sells couplings constructed in accordance with the teachings of the patent (R. 177).

The Defendant-Appellee, Irvin W. Masters, Inc., manufactures and sells tube couplings for the aircraft industry and parts therefor (R. 562).

The Defendant-Appellee, Joseph C. Collins, sells tube

couplings for the aircraft industry and parts therefor (R. 1265).

The couplings manufactured by the Defendants are identical with those manufactured by Plaintiff.

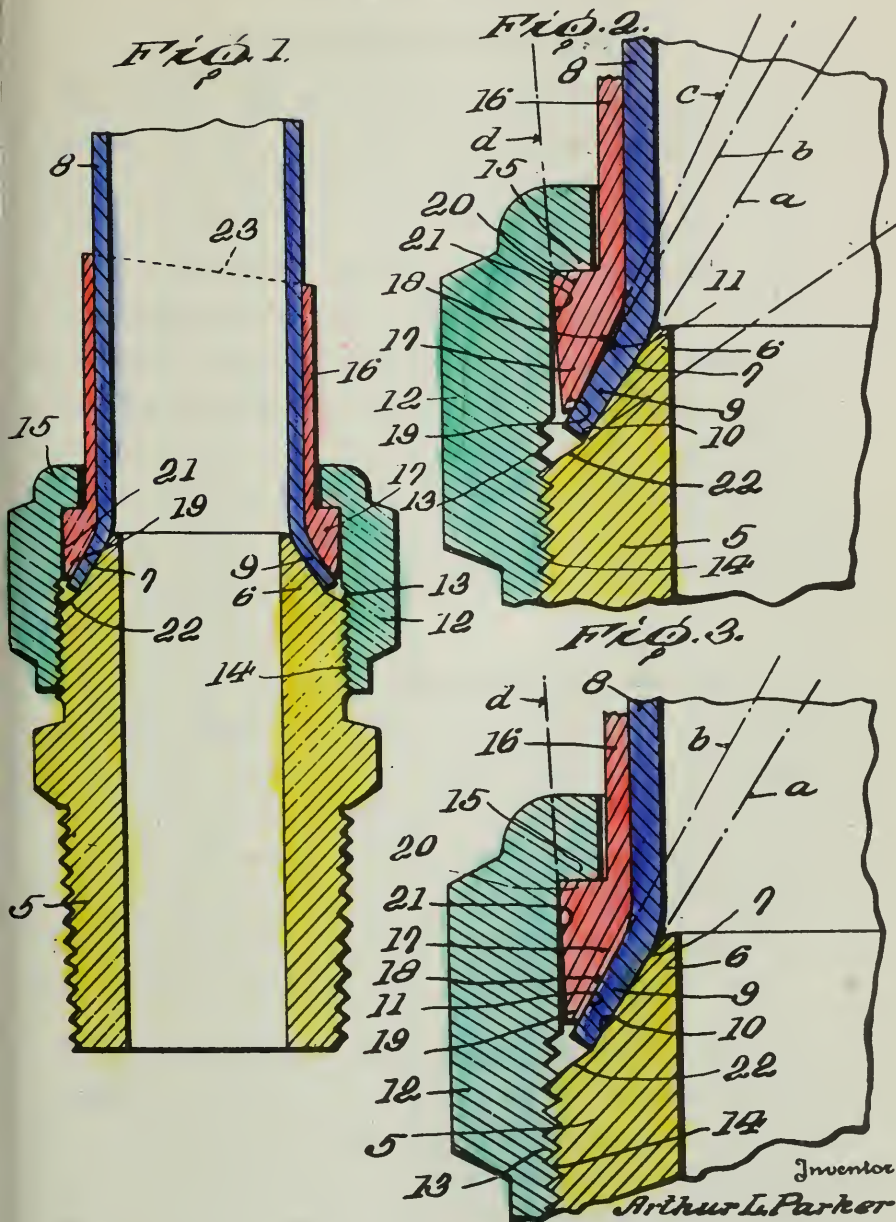
The Accused Structures.

The structures here charged as infringements of the Parker patent are the tube couplings or fittings sold by Defendants Masters and Collins. They are sold by Masters and Collins for use in aircraft and comply with the Air Force-Navy standards applicable to such couplings (Finding of Fact XI, R. 84). The dimensions of these standard couplings are given in what are known as the "AN" specification drawings (R. 1414-9), which are the joint Air Force-Navy specifications.

We here seek recovery only for couplings sold for commercial use, as distinguished from governmental use. In every respect here material, the couplings of size 8 and larger are identical and are of the construction shown in Chart 6 inside the back cover of this brief (see specification drawings, R. 1415-1417). These couplings are charged to infringe claim 2 of the Parker patent.

The size 2 to size 6 couplings include the additional feature of the Parker "differential angle" as shown by the fragmentary "detail A" drawing at the upper right corner of the sleeve specification drawing (R. 1416). The con-

struction of these couplings is shown in Chart 7 inside the back cover of this brief. These couplings are charged to infringe all the claims of the Parker patent.



By

Mason & Porter

Attorney &

Parker Patent No. 2,212,183.

The Parker patent drawing, reproduced opposite this page, shows the structure of the Parker coupling. The purpose of the coupling is to secure the flared end of tube 8 (blue) to the tapered seat 7 of the body member 5 (yellow) in a fluid-tight, secure, detachable connection. This is accomplished by the clamp nut 12 (green) which is threadedly received by the body member 5 (yellow) and, when the coupling is in tight condition, pulls the coupling sleeve 16 (red) over the flared end of the tube 8 (blue) to secure the tube in a snug, releasable fit capable of withstanding the enormous pressures encountered in aircraft hydraulic fittings even under adverse conditions of maintenance and vibration.

Figure 2 of the patent drawings shows the coupling in the "finger-tight" condition where the clamping pressure developed by nut 12 is very small. Figure 3 of the patent drawing shows the coupling in the fully tightened condition. As is discussed in further detail hereafter, the sleeve 16 (red) flexes in response to the clamping nut pressure and simultaneously extrudes or deforms the end of the flare 9 (blue) to achieve a unique, highly effective, seal.

The major elements of the Parker patent coupling—the member 5 (yellow), the clamp nut 12 (green), and the sleeve 16 (red)—are generally similar to elements used in prior art couplings (*i. e.* Parker patent No. 1,977,240, R. 1344). It is the position of Plaintiff that Parker, in patent 2,212,183 here in suit, was the first to teach the "sleeve head" angle and the "differential" angle. It is also the

position of Plaintiff that these two advances over the prior art created such a major improvement in performance over all prior couplings that they constitute invention and that the Parker patent is valid and infringed.

When the Parker Coupling Is Drawn Tight, the Sleeve Head Angle Is Reduced in Magnitude by Sleeve Flexure and the Differential Angle Disappears Because of Sleeve Flexure and Deformation of the Tubing Flare.

Chart 2, opposite this page, consists of Figures 2 and 3 of the Parker patent with explanatory legends added and unnecessary reference numerals removed. As pointed out in the patent (R. 1326), Figure 2 shows the partially assembled or "finger tight" condition of the parts where the clamp nut (green) exerts very small clamping pressure. Figure 3 shows the parts in the "fully clamped condition" after tightening with a wrench (Patent, R. 1326).

As shown on the drawing, the sleeve head angle is formed by a taper on the edge 21 of the sleeve head 17 (red). As a consequence of this taper, the toe end 19 of the sleeve head is at a greater spacing from the bore of the clamp nut than is the opposite or shoulder end of the sleeve. When the coupling is drawn to the tight condition of Figure 3, the clamp nut 12 (green) forces the shoulder on the sleeve head (red) downwardly so that the sleeve head expands or spreads at the lower end, bringing the tip 19 closer to the bore of the clamp nut while the upper end of the head spreads very little. This flexure results in a reduction of the sleeve head angle from its initial value to a smaller value.

The Parker patent describes this effect as follows:

“* * * upon continued application of end thrust by the screwing on of member 12 and engagement of the clamping shoulders 15 and 20, the head 17 will be spread or displaced radially outwardly to store gripping tension in said head and move forwardly along the flared end of the tube to cause the clamping surfaces 11, 18 and 7, 10 to tightly contact throughout the

whole of their respective areas. During the displacement or outward spreading of the head 17 the wall 21 thereof will approach the adjacent wall of the sleeve member 12, but the degree of taper of said head wall is such that it will never contact and bind against said sleeve member wall. * * *” (R. 1326, Col. 1, ll. 18-33.)

“* * * In other words, the inner flare surface of the sleeve will yieldingly clamp the flared tube end while unlimited expansion of that portion of the head adjacent the clamping shoulder will be prevented.” (R. 1326, Col. 1, ll. 43-47).

The differential angle is determined by the difference between the slope or bevel of the exterior of the tube flare 9 (blue) and the slope or bevel of the interior of the sleeve head 17 (red). The former is indicated by the line b, the latter by the line c. The angular difference between these lines is the differential angle. When the coupling is drawn to the tight condition of Figure 3, the sleeve head 17 (red) is pressed into the tubing flare 9 (blue) from the initial toe contact to a full seating engagement as the flare is deformed and as the sleeve flexes. The differential angle then becomes zero and disappears.

The Parker patent lists the differential angle among the objects of the invention, as follows:

“* * * a tube coupling * * * wherein the outer clamp member engaging the flared end of the tube is so dimensioned and shaped that contact is first made at the free end of the clamping member whereby the clamping member is caused to expand, thus bringing the entire clamping surface into intimate contact with the outer surface of the flared end of the tube with a resultant tight and efficient seal.” (R. 1325, Col. 1, ll. 14-23.)

The Parker Patent Coupling Has Enjoyed Unqualified Commercial Success.

Millions of couplings have been manufactured by Parker alone in accordance with the patent here in suit (R. 532). The present record reveals only one insignificant application of other couplings to modern airplanes (R. 698-9), and that was in connection with a small personal plane intended for the general public. All military and commercial planes use the Parker couplings exclusively.

During World War II, the government adopted certain fittings as standard for Army-Navy use (R. 380) which became commonly known as the "AN" fittings. The fittings sold by Defendants and here accused are of this type (Finding of Fact XI, R. 84). These fittings included the sleeve head and differential angles and hence presented an infringement problem. During the war, Parker gave formal letters of release to the military authorities at their request to free the government and its suppliers from all patent infringement charges based on the AN fittings or the predecessor AC 811 fitting which, by 1941, utilized essentially the same construction (R. 1401-07).

The Defendant Masters started manufacturing complete couplings, including sleeves, in the fall of 1941, after the war program was adopted (R. 641). The drawings he used for such manufacture originated with Parker (R. 641). Collins started selling about February 1942 (R. 1265-6).

The present suit is brought against post-war sale to commercial users of the couplings Masters and Collins commenced manufacturing and selling during the war under the permission granted by Parker. The suit does not involve any claims against Defendants for sales to the government, either during the war or thereafter.

The Decision Below.

Judge Westover held that the Parker patent is fatally defective because the claims use the words "so shaped" and do not contain a description of the invention in such "full, clear, concise and exact terms as to enable any person skilled in the art or science to which it appertains * * * to make, construct, compound, and use the same" (R. 68). He further held that the specification is defective because "No one, taking the patent and not using the illustrations, could make the sleeve in question 'so shaped' that it would produce the results claimed for it, without independent experimentation" (R. 70). Judge Westover further held that the Parker patent is invalid for want of invention (R. 85).

The District Court made no decision on infringement.

SPECIFICATION OF ERRORS.

The errors relied upon and urged in this appeal are as follows:

1. Holding that United States Letters Patent No. 2,212,183, issued to Arthur L. Parker of Cleveland, Ohio, on August 20, 1940, is invalid.

2. Holding that the improvements of Parker Patent No. 2,212,183 are not defined in the patent claims.

3. Holding that the descriptive portion of Parker Patent No. 2,212,183 does not describe either the sleeve head angle or the differential angle nor illustrate the same in the drawing in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains to make, construct or use the same.

4. Holding that the claims of Parker Patent No. 2,212,183 fail to particularly point out and distinctly claim

the part, improvement, or combination claimed to be the discovery.

5. Holding that the recitations in each of the claims of Parker Patent No. 2,212,183 with respect to the shape of the parts fail to particularly point out and distinctly claim the part, improvement, or combination constituting the invention.

6. Failing to hold that all of the parts described in the claims of Parker Patent No. 2,212,183 coact in a combination not shown in the prior art to produce a new result.

7. Refusing to hold that the prior art relied upon in finding 9 (R. 82) does not disclose the relationship of the outer surface of the sleeve head and the inner surface of the nut and fails to disclose the differential angle between the inner surface of the sleeve head and the tube flare shown and disclosed in Parker Patent No. 2,212,183.

8. Holding that Appellees have independently engaged in the business of manufacturing and/or supplying nuts, bodies, and sleeves separately but not as assembled fittings to ultimate users and failing to hold that Appellees have sold nuts, bodies and sleeves as a group in a single transaction.

9. Finding that neither the description, drawings, nor claims of Parker Patent No. 2,212,183 contain dimensions, proportions, or angular relationships corresponding to the dimensions, proportions or angular relationships contained in the government specifications under which the accused fittings and parts were made or sold.

10. Holding that no one, by reference to the Parker Patent No. 2,212,183, could produce a fitting which would achieve the results called for by the patent without experimentation.

11. Holding that the contribution of Parker Patent No. 2,212,183 to the art is extremely narrow and that the

language of the claims is broad and ambiguous and broader than the invention.

12. Holding that the claims of Parker Patent No. 2,212,183 are functional at an exact point of novelty and lacking in essential structural description.

13. Holding that Plaintiff attempted to enlarge the claims of the patent in suit.

14. Failing to hold that Parker Patent No. 2,212,183 is infringed by the accused devices.

15. Holding that the differences disclosed and claimed in Parker Patent No. 2,212,183 over the prior art are merely the work of a skilled mechanic and do not involve patentable invention.

16. Failing to hold that the changes made in Parker Patent No. 2,212,183 over the prior art with respect to the relationship of the outer surface of the sleeve head and the inner surface of the nut and the differential angle between the inner surface of the sleeve head and the tube flare give rise to a new coaction of the parts and a new combination rising to the dignity of invention and patentable.

17. Failing to hold the changes made in Parker Patent No. 2,212,183 over the prior art with respect to the relationship of the outer surface of the sleeve head and the inner surface of the nut and the differential angle between the inner surface of the sleeve head and the tube flare are properly defined in the patent claims and in a manner complying with Section 4888 R. S.

18. Holding Parker Patent No. 2,212,183 invalid because the claims therefor do not comply with Section 4888 R. S. 35 U. S. C. A. 33 in accordance with the statements in *Sales Affiliates, Inc. v. Hutzler Bros. Co.*, 71 F. Supp. 287; *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U. S. 405; *Yale Lock Co. v. Greenlaw*, 117 U. S. 554; *Incandescent Lamp Patent Case*, 159 U. S. 465; *Halliburton*

Oil Well Cementing Co. v. Walker, et al., 329 U. S. 1; and *General Electric Company v. Wabash Appliance Corp.*, 304 U. S. 364.

ARGUMENT ON INVENTION.

We depart from the order of Judge Westover's opinion to consider first the issue of invention. We do this advisedly because an understanding of the Parker invention and its importance to the industry is a necessary frame of reference for consideration of the other issues of this case. The error of the District Court is attributable in a large measure to its complete failure to make this initial and basic inquiry.

We appreciate that a finding on invention is normally a finding of fact. However, in this case the findings are clearly erroneous and reversible because the facts decisive of the invention question are either formally admitted by Defendants or uncontradicted on the record. These facts, wholly ignored in the opinion and findings below, require reversal.

In *Cutter Laboratories v. Lyophile Cryochem*, 179 F. (2d) 80, 84 (1949), this Court reversed a finding on invention, even though the finding was based on a jury verdict. There, as here, the issue of invention did not turn on reconciling conflicting testimony and was accordingly open to review. Similarly, in *Chas. Peckat Mfg. Co. v. Jacobs*, 178 F. (2d) 794, 797 (C. A. 7, 1949), the court reversed a finding of non-invention because an examination of the prior art patents showed that the decisive feature of patentability was not in the art.

The lengthy opinion filed in this case (R. 65-77) does not discuss the prior art. It cannot do so and still reach the erroneous conclusion that the Parker patent is invalid for in this case, as in the *Peckat* case, the prior art fails

to disclose the crucial features of novelty—namely, the differential angle and the sleeve head angle.

It Is Undisputed On the Record That the Sleeve Head Angle and the Differential Angle Were Wholly New With Parker.

The record is perfectly clear that neither the sleeve head angle nor the differential angle were known to the art prior to Parker's invention. The following testimony of Defendant's expert Adams not only refutes any possible contention to the contrary but in addition is an admission that the sleeve head angle, one point of departure of Parker from the prior art, is embodied in the fittings here accused:

“Q. How do you rank the Bjorling publication?

A. Well, I would say it is the best anticipation of the tube fittings as they are actually built; that Patent 2,212,183 does not actually represent the fittings the way they are built. You ask me for the best anticipation of the patent.

Q. That is right.

A. I think this Bjorling reference is the best reference to the actual tube fittings.

Q. Does the Bjorling reference show an angle on the outside of the sleeve?

A. No.

Q. And do the fittings that are used by the Douglas Aircraft Company which you have here produced as samples in connection with Exhibits WW, XX, YY and AAA, provide an angle on the outside of the sleeve?

A. Yes, although we don't think it is important.

Q. I just am asking you now as a fact whether or not those exhibits did in fact include the angle on the sleeve.

A. Yes.

Q. And it is a fact that the Bjorling publication does not include an angle on the sleeve?

A. That is correct.

Q. And it is a fact that in the Bjorling publication, the drawing there illustrates a sleeve, the outer wall of the head of which is parallel with the inside wall of the nut throughout its entire length; correct?

A. Yes, correct.

Q. And in that respect, the Bjorling publication differs from the Parker patent in suit, which does not include an angle arrangement there on the outside of the sleeve?

A. That is correct.

Q. And in that respect, the fittings that you have here produced, or those here charged to infringe, likewise differ from the Bjorling publication in that they do provide an angle on the sleeve; correct?

A. Yes.

Q. And in respect to the Parker patent in suit and the fittings here charged to infringe, both do include an angle on the outside of the sleeve; correct?

A. Yes.

Q. And in the fittings here charged to infringe, the upper portion of the sleeve closely adjacent the region of contact with the nut is in closer relationship to the nut than at the lower end of the sleeve; correct?

A. Yes.

Q. And in that respect, the devices here charged to infringe follow the Parker patent and not the Bjorling fitting; correct?

A. In that respect, yes." (R. 779-781.)

Masters himself testified that the sleeve head angle is not in the prior art (R. 648). He later stated:

"* * * Can you tell me where that (the sleeve angle) was originated, so we have the complete story?

A. I believe that originated with Parker Appliance Company" (R. 651).

Even counsel for Defendants, when questioned by the Court with respect to the sleeve head angle, stated:

"Mr. Huebner: As far as I know the art, your Honor, this is the first disclosure of an angle of this character initially present between the outside of the sleeve head and the inside of the nut. * * *" (R. 458.)

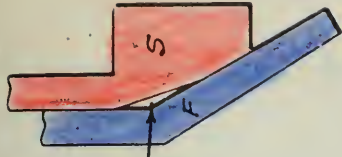
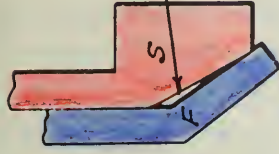
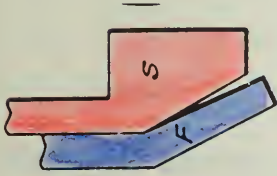
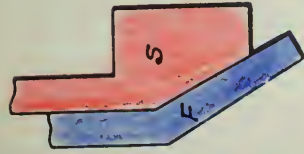
With respect to the differential angle, Defendants' own representations show that it is not only absent from the art but in addition that it is a point of similarity between the size 2 to 6 accused couplings and the Parker patented coupling. Chart 3 (taken from Defendants' Brief before the District Court*) shows this point clearly by means of cross-sectional sketches of the coupling constructions. The differential angle is present in only two sketches—the Parker patent in suit and the accused couplings.

Masters has testified that he did no independent research in connection with the couplings which he had manufactured (R. 1259-60). In fact, he admitted that the drawings he used for manufacture originated with Parker (R. 641) and that, prior to receiving the Parker drawings formally in 1943 (R. 1336), he had "filched" the information (R. 639). Masters also testified that with respect to the AN couplings Parker was the "father of this child" (R. 639). Collins testified that he has no engineering staff and that the fittings he sells are not of his design (R. 1286-7).

A Patent Is Presumed to be Valid. The Presumption Is Especially Strong Where, As Here, the Subject Matter of the Invention Is New.

It is settled law that a patent is presumed to be valid. As stated by the Supreme Court in *Mumm v. Jacob E.*

* Title, color, and typed notations added.



Differential
Angle

$S = \text{Sleeve} : F' = \text{Flare on Tubing}$

Pat. No. 1,893,442

(Pl's Exh. 25)

Prior Art

Pat. No. 1,977,240

(Pl's Exh. 26)

Prior Art

Pat. No. 2,212,183

(Def's' Exh. 'RR'
(Pl's Exh. 1)

Patent in Suit

Special AN. Std. Ftg.

Alum. Bronze #2-6

(Def's' Exh. 'P''
(Pl's Exh. 70)

Accused Couplings
(Sizes 2 to 6)

Chart 3 -- The Differential Angle Is Not Shown In the Prior Art. It Is a Point Of Similarity Between the Smaller Sizes Of Accused Couplings and the Parker Patent Coupling.

Decker & Sons, 301 U. S. 168, 171 (1937), the burden of proving invalidity

“* * * is a heavy one, as it has been held that ‘every reasonable doubt should be resolved against’ (the Defendant) * * *.”

Or, as stated by this Court in *Bianchi v. Barili*, 168 F. (2d) 793, 795 (1948):

“* * * Before a patent can be declared invalid because of anticipation, its lack of novelty must be established beyond a reasonable doubt (citing cases).”

This Court applied the same rule in *Payne Furnace Co. v. Williams-Wallace Co.*, 117 F. (2d) 823, 826 (1941).

This presumption of validity is especially strong in the present case. There is no question of weighing prior art. **There is no prior art to weigh.** The credit that attends the Examiner’s determination of novelty is doubly significant where, as here, novelty of the crucial features of patentability cannot be disputed on the record.

Any holding of invalidity here demands a finding that the Patent Examiner was wrong—a finding wholly unsupported by any new evidence. The District Court made such a finding but it did so only by ignoring this fundamental deficiency and by giving no weight to the Examiner’s decision.

The Parker Coupling Was Developed After Many Efforts in the Aircraft Industry to Obtain a Satisfactory Coupling for Flared Tubes. It Replaced All the Prior Art Constructions.

The present record is replete with proof that the aircraft industry had long sought, prior to the Parker patent here in suit, a suitable coupling. The Army and Navy maintained sustained interest in the development of fittings over many years (R. 941-2). The nineteen patents and

publications relied upon by Defendants alone show the wealth of experience, both in the aircraft field and elsewhere, that had accumulated prior to the Parker invention (R. 43-44).

Most revealing of all, however, is the story told by Masters, party in interest to the Defendant corporation, who was engaged in research for an improved coupling for use in naval aircraft starting in 1932 (R. 563). One consequence of this research, undertaken as an employee of the Navy Department, was the development of the so-called NAF fitting. This fitting was manufactured and was used on naval aircraft. However, like all other coupling constructions, it was later discarded in favor of the Parker fitting and is now found only in older ships (R. 564).

Also, as early as 1935 Parker itself manufactured the so-called AC-811 fitting which is shown in patent 1,893,442 (R. 386-8, 1341). This fitting was used considerably but even it was later altered, in 1939 or 1940, to include the sleeve head angle feature of the patent here in suit (R. 501). In 1941 the differential angle was also added to the smaller size AC-811 fittings (R. 711).

Notwithstanding these sustained developmental efforts, the Armed Forces ultimately standardized on a coupling using the sleeve head and differential angles and have continued that standardization to the present time.

The District Court recognized these numerous efforts to develop improved fittings (R. 65, 73, 74, 76). Yet it inconsistently regarded this history as limiting rather than reinforcing the significance of Parker contributions. This is neither good sense nor good law.

It is classic patent law that the unsuccessful efforts of the past are strong evidence of inventive merit. For example, in *Hildreth v. Mastoras*, 257 U. S. 27, 34-35 (1921), the Supreme Court, affirming this Court, stated:

“* * * The history of the art shows that Dickinson

took the important but long delayed and therefore not obvious step from the pulling of candy by two hands guided by the human mind and will, to the performance of the same function by machine. The ultimate effect of this step with the mechanical or patentable improvements of his device was to make candy pulling more sanitary, to reduce its cost to one-tenth of what it had been before him, and to enlarge the field of the art. He was, therefore, a pioneer."

It is also classic law that under these circumstances what appears to be trivial or obvious is a very real invention because those in the art, who can be trusted to know the obvious, failed to take the step that solved the problem so long confronting the art.

In *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U. S. 45 (1923), the inventive concept consisted of merely sloping the wire carrying the paper stock in a downward direction so that the natural tendency of the stock to go downhill aided the motion of the wire. The evidence showed that this very simple idea, which was "an obvious application of the principle that water will run downhill" (261 U. S. page 52), gave rise to a marked increase in the permissible rate of paper manufacture. The Supreme Court, relying on the fact that the industry long sought a faster paper making machine and had adopted the Eibel contribution, held that the Eibel patent was valid and infringed and that the Court of Appeals had erred in holding otherwise.

More recently, in *Goodyear Tire & Rubber Co. Inc., et al. v. Ray-O-Vac Co.*, 321 U. S. 275 (1944), the Supreme Court upheld a patent to an invention even more simple than that of Eibel, namely, a metal encased flashlight battery. In that case the inventor had the very simple concept that leakage and swelling in a dry cell battery can be prevented by the use of a retaining jacket of metal. The Court stated:

"Viewed after the event, the means Anthony adopted

seem simple and such should have been obvious to those who worked in the field, but this is not enough to negative invention * * *'' (321 U. S., page 279.)

Parker likewise taught new concepts—the sleeve head angle and the differential angle. These concepts are wholly new. As in the *Hildreth*, *Eibel* and *Goodyear* cases, these concepts were superficially simple. As in those cases, these concepts solved problems that long plagued the art. As in those cases, there is invention.

The District Court ignored these basic rules of law and common sense when he used the “continuing and everlasting search” in the industry as an excuse to invalidate the patent (R. 76). The decisive facts are that this research (including that of Masters) failed to produce the Parker advance before it was taught by Parker; the Parker advance was quickly adopted in the exacting aircraft field; and no device superseding the Parker advance has as yet been produced.* There can be no better demonstration of the true merit of Parker’s contributions.

The Army and Navy, After Searching For a Non-Proprietary Coupling, Nevertheless Standardized on the Parker Patented Couplings.

Defendants’ witness Masters testified that the Army and Navy sought “non-proprietary” couplings; namely, couplings that presented no patent problems (R. 563, 651). In fact, he participated in a search for such couplings (R. 563). Yet these organizations not only accepted Parker couplings but were forced, by the failure of other fittings to meet requirements, to standardize on their use to the exclusion of all other couplings (R. 1220). This occurred

* The only record evidence of a coupling for flared tubes, other than the AN coupling (or its equivalent, the revised AC-811 Parker fitting), in use on modern planes is the 300 Navion aircraft made by North American in 1945 and 1946 (R. 698-9). The choice of two-piece fittings for these small personal planes was dictated by cost and procurement considerations—not by performance (R. 699).

in 1941, only a year after the Parker patent issued (R. 380).

The decision to standardize was not made blindly. The evidence is undisputed that the couplings were recognized as proprietary by both government and industry. Prior to the AN standardization, Parker made the so-called AC-811 fitting which, by 1940, included the sleeve head angle feature of the patent here in suit (R. 478). The government sought, and received, a patent release from Parker on this fitting, a release effective for the duration of the war (R. 1401-1407). Parker granted specific releases to a large number of companies (R. 520-522). When this construction was adopted as an AN standardized fitting, this permission was continued.

Moreover, the government consistently referred to the couplings as "Parker type" fittings. This was done, for example, in the production report, Plaintiff's Exhibit 72, which contains this identification on every page (R. 1395-1400). It is hard to imagine a more impressive demonstration of the fact that the couplings were considered proprietary.

The Armed Forces not only standardized on the Parker type fitting but relied on Parker for the requisite drawings. Parker had more than five people doing nothing but sending out these drawings to manufacturers and users (R. 524). The drawings that guided the Defendant Masters in making the fitting here accused were sent from Parker to Masters under this program (R. 1336).

With respect to these drawings, Masters testified:

“ * * * so then it became necessary for us all to have our drawings coordinated and the best place to coordinate them was, of course, to get them from Parker, who was the father of this child and they did supply the industry with drawings. But previous to that we had filched the information in one way or

another before, so we didn't need many from them'' (R. 639).

The industry itself considered the Parker couplings proprietary. Parker engaged in an active research and development program (R. 177) and, in 1942, before the AN standardization, Parker sold 80% of the available coupling business (R. 530). The inference is clear that the industry respected Parker's position that the fittings were proprietary. By 1944, however, when Parker had granted numerous letters of permission, Parker's share of the business was only 29 or 30% (R. 531).

The Civil Aeronautics Administration has suggested the use of the AN or Parker type fittings on commercial aircraft (R. 698).

The history of the adoption of the differential angle in the AN standard is particularly revealing. This feature was not included in the standards for the AC-811 Fitting (Predecessor to the AN Fitting). Defendants' expert witness Adams testified that in the fall of 1940, an airplane accident occurred and investigation definitely identified the cause as a broken coupling in the hydraulic system of the plane which prevented lowering the landing gear wheels (R. 711). Adams testified that he then recommended an additional bevel or angle on the sleeve of the smaller size fittings to obtain the differential angle (R. 711-712).

While the differential angle is used only on the smaller sized fittings, this experience is a conclusive demonstration of the significance of Parker's contribution.

Standardization by the Air Forces and Navy on the Parker structure—despite its recognized proprietary character—speaks eloquently of the importance of the sleeve head angle and the differential angle and the merit of the contributions made by Parker to the industry. The same

considerations that dictated this adoption by the Armed Forces dictate a holding here that Parker made an invention and an important one.

**The Parker Coupling Was Disclosed to the Trade in 1940.
In the Decade Since That Time No Superior Fitting Has
Been Developed.**

It is particularly significant that the record is devoid of any evidence of actual manufacture of a coupling replacing or superseding the Parker coupling. Parker's invention became public knowledge in 1940 when the patent issued (R. 1323). The trial below took place a decade later. The period was one of intense activity in aircraft development. Yet that intense development has not yet produced a fitting sufficiently good to replace the Parker coupling.

Moreover, Defendants' expert Adams testified that:

"We make experiments on any type of new fitting and parts in trying to improve airplanes. When we find one that appears enough better than previous article, than the article currently in use, when it is enough better to justify the disturbance to our manufacturing that is caused by the introduction of a new part, we then try to get this adopted as a standard and try to change over to its use, if it is sufficiently better to justify a manufacturing disturbance." (R. 744.)

Adams was right—but all the experiments on "any" type of new fitting in over a decade have failed to produce a fitting better than that of the Parker patent. We cannot conceive of more persuasive evidence of the merit of Parker's contribution.

In *Payne Furnace and Supply Co. v. Williams-Wallace Co.*, 117 F. (2d) 823 (1941), this Court, holding a patent valid, stated:

"Stadtfield's improvement occurred within the con-

finer of an ancient art. Its immediate and wide commercial adoption is powerful evidence of invention as contrasted with the exercise of mere mechanical ingenuity. Compare *Paramount Publix Corporation v. American Tri-Ergon Corporation*, 294 U. S. 464, 474."

The invention in the *Payne* case related to smoke pipe constructions, an art as old as the earliest stove pipe. The Parker invention relates to hydraulic pipe connectors, an art equally old. In this case, as in the *Payne* case, there was "immediate and wide commercial adoption" that is "powerful evidence of invention." Here we have the additional factor, not present in the *Payne* case, of continuous efforts to develop an improved fitting, all without avail.

It is significant that the "ancient art" of the *Payne* case went back to 1885 (117 F. (2d) at p. 825). Here the "ancient art" goes back to 1865 (R. 12).

The industry has further recognized the Parker contribution by taking patent licenses. The Weatherhead Company, one licensee, has been paying \$1,800 a quarter in royalties alone (R. 534). The Deutsch Company has taken an agreement with a minimum royalty of \$12,500 yearly for three years (R. 537).

The Parker Coupling Has Met, to the Exclusion of Other Couplings, the Demands of the Aircraft Industry. These Demands Are Exceedingly Severe.

We are prepared to explain the importance of the Parker contribution in terms of the improved results achieved as well as by its impact on the art. Any such explanation, however, would be futile without some mention of the severe coupling problems encountered in aircraft service. It is these problems that impart to the Parker coupling the very extensive acceptance it has enjoyed.

The witness Bergh, chief staff engineer of Republic Aviation Corp., testified:

“A. Yes, I think that all the troubles we have with airplanes—and by ‘troubles’ I mean big troubles, either serious damage to the airplane or loss of the plane or fire as a result of fluid line leaks—I would say that things such as these, and other relatively small things when you see them, are the cause—not only fluid line connections, but I mean spacing electric wires properly and putting insulation on them—things of that type I think are responsible for a lot more than fifty percent, and I should say seventy-five percent of the real troubles that we have on our airplanes, aside from accidents due to the planes themselves. Putting it another way, airplanes do have accidents, and the majority of course are due to the pilot’s error or to the weather, but subtracting that kind of accidents, which are caused by either the pilot or the weather, improper information given to him over the radio or something like that—those are caused to a much higher degree than would be caused by the structural weakness of the airplane itself.

“I might say that our own experience has been that, when we have an accident, ninety percent of the time it is due to faulty installation rather than structural design, so it is the little things that make the big difference, and I have always found that if you lick the little things, they create the majority of our headaches.” (R. 1206.)

The evidence of the severe operating conditions encountered in aircraft service is uncontradicted. The witness Amon, a graduate engineer of many years experience in aviation (R. 941-3), testified that the fittings are used in the fuel lines, landing gear operating mechanisms, wing flap raising and lowering devices, propeller feathering mechanisms, and in the instrument systems (R. 931-2).

In the fuel systems the couplings or fittings carry fuel from storage tanks to the engines. Interruption of fuel

means loss of engine power—leakage creates an exceedingly serious fire hazard (R. 938-9).

In the hydraulic systems, the couplings are called upon to withstand enormous pressures—3000 lbs. PSI on modern planes (R. 933). Leakage, even at these pressures, may mean an inoperative landing gear with the consequent need for a dangerous “belly landing” (R. 938). In fact, it was just such an accident that led to adoption of the differential angle feature in the size 2 to size 6 fittings (R. 711).

In other applications, the couplings perform equally vital functions.

The couplings must not only perform their intended functions, but, in addition, they must do so under adverse conditions. Airplanes are notorious for the vibrations they produce—vibrations evident even to the casual rider in a cushioned cabin (R. 936). Water hammer effect, at tremendous pressures, adds to this vibration (R. 934-8). Obviously, a coupling that will not stay tight under this vibration is useless. It is equally obvious that a high degree of ingenuity is required to provide a coupling that will withstand this vibration and shock.

Moreover, the evidence is undisputed that the couplings must not only have a high degree of reliability under adverse operating conditions but, in addition, they must be capable of withstanding the physical abuse of overtightening and be capable of repeated assembly and disassembly without harm. In actual service, the couplings are tightened and retightened by mechanics in the field, who may or may not have the equipment, technical data, or ability to measure the degree of tightening (R. 211). The AN specifications require the coupling to withstand fifteen assemblies and disassemblies without damage and endure excess tightening just because of this problem (R. 210, 511, 978).

The witness Middleton, presently employed at Lockheed and for years head of the Hydraulics Laboratory of the Army Air Corps at Wright Field, Dayton, Ohio (R. 882), testified that with the P-36 type airplane there were a large number of accidents and deaths from landing gear failure. These were due to tubing failures resulting from overtorquing or overtightening of couplings (R. 888-9). He testified also that fittings with the sleeve head angle tend to overcome failures of this kind (R. 890).

These severe performance requirements must not only be met in aircraft couplings but they must be met without excessive weight or size. Some 6000 couplings are installed in a large plane (R. 1052). The size of each coupling, and its ease of adjustment and installation, are important because couplings must be placed in confined spaces in airplanes (R. 950-1).

For over a decade, the aircraft industry has found that these requirements have been met best by the Parker coupling—so much so that there is no record of any other coupling enjoying approval by the Air Force and Navy or even being used extensively in any commercial production.

The Sleeve Head Angle, New With Parker, Gives Rise to Hoop Tension in the Sleeve Head to Minimize Nut Jamming. At the Same Time the Sleeve Head Angle Prevents Loosening of the Coupling Under Vibration.

One of the Parker contributions to the art is the sleeve head angle shown in Chart 2, page 9, this brief. This angle is formed by tapering the sleeve head in relation to the bore of the clamp nut so that at the seating portion, the sleeve head is relatively close to the bore in clamp nut 12 and at the toe portion 19 the sleeve head is at a relatively great spacing from the bore.

The patentee Parker very clearly describes in his specification how, when the coupling is drawn tight, the sleeve head angle is reduced in magnitude as shown in Fig. 3 of the patent (R. 1326). There is no dispute in the present case that the sleeve head angle makes possible this flexure which is a progressive flexure creating a "hoop tension" as the clamp nut is tightened. In fact, the tests made by Masters show that in every case when the clamp nut is tightened, the toe end of the sleeve head expands to a substantially greater extent than the seating end (compare expansion measurements at A and C, Defendants' Exhibit S, R. 1426). This is proof positive of the action of this Parker feature. The witness Wolfram also testified that the sleeve undergoes varying degrees of expansion along its length (R. 273-4).

The sleeve head angle was wholly new with Parker. Even Masters admitted this to be the fact (R. 651).

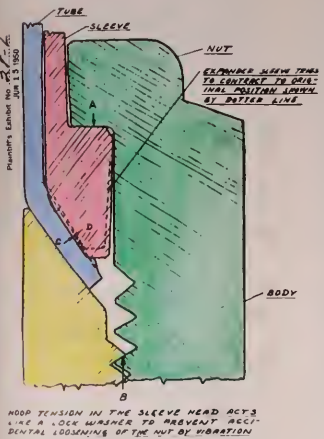
The witness Wolfram, who has had more than a dozen years experience with fittings (R. 179), gave detailed testimony with respect to the advantages of the particular hoop tension associated with the sleeve head angle. These advantages include:

1. Lock washer action to prevent loosening of the coupling under vibration (Exhibit 28L, Chart 4, this brief; R. 243).

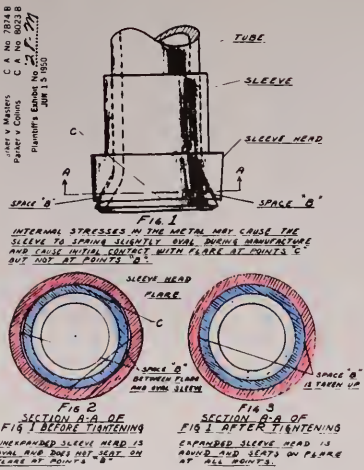
Defendants' witness Bumb testified that he experienced noticeably greater coupling difficulty on the F-86 fighter than the B-45 bomber because of the greater vibration and difficulty of getting at fittings in the former plane (R. 702-3). This lock washer action also makes the amount of nut turning less critical (R. 249, 1362). Masters himself testified that there was a "great deal of trouble" with over-tightening of fittings (R. 582).

2. Free expansion of the sleeve head to correct out-of-round sleeves (Exhibit 28M, Chart 4, this brief; R. 246).

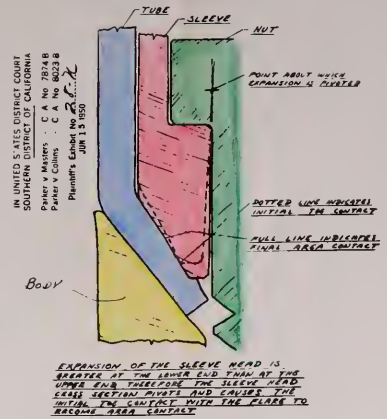
ADVANTAGES OF SLEEVE HEAD ANGLE
HOOP TENSION LOCKS NUT
AGAINST LOOSENING



ADVANTAGES OF SLEEVE HEAD ANGLE
FREE EXPANSION CORRECTS
OUT-OF-ROUND SLEEVES



ADVANTAGES OF SLEEVE HEAD ANGLE
EXPANSION CONVERTS TOE
CONTACT TO AREA CONTACT



ADVANTAGES OF SLEEVE HEAD ANGLE
ANGLE PROVIDES ADDITIONAL CLEARANCE
TO AVOID LOCKING OF SLEEVE TO NUT

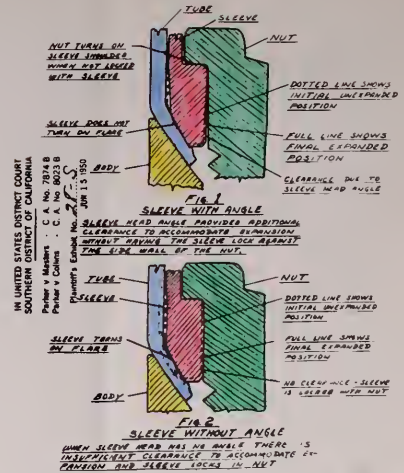


Chart 4 -- The Sleeve Head Angle, Which Was Wholly New With Parker, Provides a Hoop Tension Sleeve Flexure. This Flexure, and the Resultant Advantages, Accounts For the Adoption Of This Parker Feature By the Industry.



3. Additional clearance to prevent locking the sleeve to the clamp nut while at the same time providing maximum seating area between the clamp nut and the sleeve (Exhibit 28S, Chart 4, this brief).

4. Automatic conversion of the line contact between the toe of the sleeve head and flare, before tightening, to the conical contact of substantial area after tightening (Exhibit 28N, Chart 4, this brief; R. 247).

Other important advantages of the sleeve head angle are explained in the charts, Exhibits 28J to 28W (R. 1357-70), testified to by Wolfram.

The importance of these advantages in a practical coupling is shown decisively by the fact that the AN specifications very clearly require a one degree taper in the sleeve head (R. 1416). If this taper is not necessary or desirable, why is it required by the specifications? The Parker patent has been in existence since 1940 and has been consistently brought to the attention of the industry by Parker. Yet the sleeve head angle is not considered optional—it is required.

The Parker Differential Angle Provides an Initial Toe Contact That Not Only Cooperates With the Sleeve Head Angle to Facilitate Sleeve Flexure But Also Independently Aids in Effecting a Tight Secure Seal.

The differential angle is defined by the lines b and c of Figure 2 of the Parker patent drawing (see Chart 2, page 8a, this brief). It disappears when the clamp nut (green) is drawn tight to flex the sleeve (red) to a full seating contact with the tube flare (blue). The parts are shown in this fully clamped position in Figure 3 of the Parker patent drawing (page 9, this brief). Although transitory in character, the differential angle imparts several very important advantages to the Parker structure, including:

1. Small clamping stress is exerted at the heel of

the flare even though a firm conical seating engagement is ultimately obtained over the full beveled area of the sleeve (Exhibit 28AA, Chart 5, this brief).

Defendants' expert Adams himself had the experience of an accident due to coupling failure from excessive heel pressure (R. 710-2). The differential angle was adapted in size 2 to size 6 fittings to prevent further accidents of this kind (R. 711).

2. The initial toe contact facilitates formation of the holding nub in the tube flare (Exhibit 28Y, Chart 5, this brief).

As shown in the bottom two sketches of Exhibit 28Y, neither initial full contact, nor an initial heel contact (the two prior art arrangements) gives rise to digging-in action that facilitates nub formation. Moreover, the extruded metal forming the nub when the differential angle is provided is taken primarily from the tip of the flare where it has minimum tendency to weaken the flare.

3. The initial toe contact, being at the outer portion of the sleeve head, provides a greater moment arm to flex the sleeve in hoop tension (Exhibit 28DD, Chart 4, this brief).

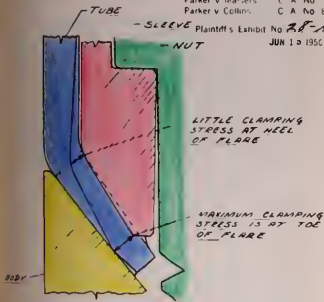
In this respect the sleeve head angle and the differential angle coact to achieve an improved action not possible with either alone.

Simplicity Is Not the Test of Invention. Parker Cannot be Denied the Status of Inventor Because His Changes in Retrospect Seem Simple.

Defendants have persistently urged that the Parker contributions of "sleeve head angle" and "differential angle" are merely matters of clearance and so simple that they cannot support a patent. This is a false issue. The point is not whether, in retrospect, Parker made superficially simple changes—it is whether the changes Parker

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT RESISTS VIBRATION FAILURE



INITIAL TOE CONTACT INCREASES RESISTANCE TO BREAKING OF THE TUBE DUE TO VIBRATION FATIGUE BY CONCENTRATING MOST OF THE CLAMPING STRESS AT THE TOE OF THE FLARE WITH A GRADUALLY DECREASING STRESS TOWARD THE HEEL WHERE VIBRATION STRESSES CONCENTRATE

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters C A No 7874 B
Parker v Collins C A No 8023 B

Plaintiff's Exhibit No 28-AA

JUN 13 1950

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT FACILITATES FORMATION OF HOLDING NUB

JUN 13 1950

Plaintiff's Exhibit No 28-Y

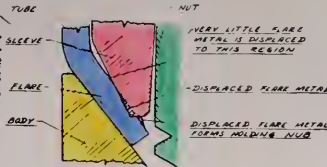


FIG 1
INITIAL TOE CONTACT
TOE CONTACT UTILIZES MINIMUM FLARE METAL DISPLACEMENT AND HENCE MINIMUM WRENCH TORQUE TO FORM HOLDING NUB

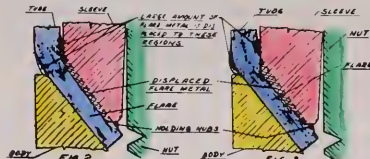


FIG 2
INITIAL FULL CONTACT
UTILIZES LESS DISPLACED FLARE METAL HENCE REQUIRES MORE WRENCH TORQUE TO FORM NUB

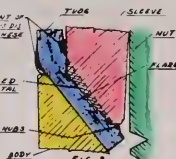


FIG 3
INITIAL HEEL CONTACT
UTILIZES A MINIMUM OF DISPLACED FLARE METAL HENCE REQUIRES MAXIMUM TORQUE TO FORM NUB

ADVANTAGES OF DIFFERENTIAL ANGLE

TOE CONTACT FACILITATES EXPANSION OF SLEEVE HEAD

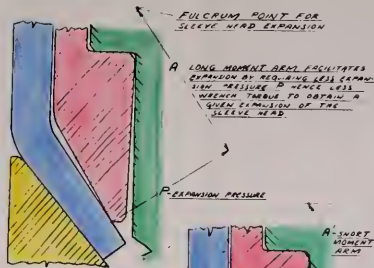


FIG 1
INITIAL TOE CONTACT
RESULTS IN READY EXPANSION AT LOW WRENCH TORQUE BUT EVENTUAL FULL CONTACT RESISTS OVER-EXPANSION AT HIGH TORQUE

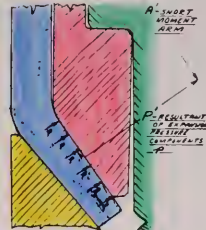


FIG 2
INITIAL FULL CONTACT
REQUIRES HIGHER WRENCH TORQUE TO OBTAIN INITIAL EXPANSION

IN UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF CALIFORNIA

Parker v Masters C A No 7874 B
Parker v Collins C A No 8023 B

Plaintiff's Exhibit No 28-OB

JUN 13 1950

Chart 5 -- The Differential Angle, Which Defendants' Expert Adams Found Essential, Permits a Nub-Defining Deformation Of the Flare Without Weakening the Vital Heel Portion Of the Flare. It Also Coacts With the Sleeve Head Angle To Facilitate Sleeve Flexure.

did make had a significant impact on the art. The latter test compels a conclusion of invention.

One cannot test invention by after-the-fact simplicity. Monday morning quarterbacking on this point is forbidden in the patent law.

This is not only a proposition of law, but a matter of plain, common sense. If Parker's ideas were so obvious, why didn't the workers in the art seize upon them long before Parker?

In the metal encased flashlight battery decision, the Supreme Court stated:

"Viewed after the event, the means Anthony adopted seem simple and such as should have been obvious to those who worked in the field, but this is not enough to negative invention."

Goodyear Tire & Rubber Co. v. Ray-O-Vac Co.,
321 U. S. 275, 279 (1944).

Application of this common sense reasoning can only lead to a finding that Parker made an invention.

Also in *Loom Co. v. Higgins*,* 105 U. S. 580, 591-592, (1882) the Supreme Court said:

"At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. Now that it has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit. It may be laid down as a general rule, though perhaps not an invariable one, that if a new combination and arrangement of known elements produce a new and beneficial result, never attained before, it is evidence of invention. It was certainly a new and useful result to make a loom produce fifty yards a day when it never before had produced more

* Quoted by this Court in *Bianchi v. Barilli*, 168 F. (2d) 793, 799 (1948).

than forty; and we think that the combination of elements by which this was effected, even if those elements were separately known before, was invention sufficient to form the basis of a patent."

In the present case any test of simplicity is made doubly illogical by the fact that couplings perform a vital function in aircraft. The witnesses, including top-grade engineers from nearly every leading aircraft manufacturer, testified unanimously that failure of a fitting can, and has, resulted in fatal accidents. It is truly a matter of life or death to pilots and passengers. Use of the Parker couplings has spelled out safety—something that is never simple or trivial.

Every dictate of reason and law indicates that the Parker fitting, which has displaced all others in this most vital application, is inventive and that its superficial simplicity does not detract from this fact.

The District Court Misconstrued the Issue of Validity in Holding That Validity "Depends Upon the Sleeve."

The error of the District Court is directly traceable to the erroneous assumption that the novelty of the Parker patent depends on the sleeve (R. 65). Equal error was made in inconsistently asserting that the patent covered a "flare" (R. 76).

We claim no patent on a sleeve. We claim no patent on a tubing flare. Our only claim is to that which Parker admittedly contributed to the art—namely, a coupling embodying the sleeve head angle, the differential angle, or the combination of the two.

Of course, there is no invention if we measure invention by something Parker did not contribute and did not claim he contributed. The conclusion is equally irresistible that there is invention if the test is the sleeve head angle and

the differential angle which Parker did contribute and did claim.

Conclusion On Invention.

The Parker patent coupling embodies two wholly new features—the sleeve head angle and the differential angle. They made possible a coupling capable of meeting all of the exacting requirements of the aircraft industry, including resistance to shock and vibration, ability to effect a tight seal under adverse conditions, operability under a wide range of tightening, and many others.

The aircraft industry long sought the Parker invention. Efforts were made to obtain a structure having its characteristics—all to no avail. When the Parker coupling was introduced it replaced the existing couplings. It remains as standard to this day.

There is no real dispute as to these facts. Yet they are decisive of the issue of invention. Only by ignoring them could the District Court deny Parker the status of inventor. The findings, wholly inconsistent with these facts and without rational basis, are clearly erroneous.

The industry, the Army and the Navy aircraft experts, and the Patent Examiner are right—Parker made a patentable invention.

ARGUMENT ON CLAIM LANGUAGE.

The major portion of the opinion by the District Court is devoted to the technical issue of the claim language used by Parker's solicitor. This portion of the opinion, and the resultant findings, are erroneous because the District Court misconstrued the language of the controlling statute and failed to consider the nature of the Parker invention in applying the cases.

This question of claim language is solely a question of compliance with the applicable statutes. No disputed questions of fact are involved other than those facts gratuitously injected, without support on the record, by the District Court. It is paradoxical that this portion of the opinion, which was most heavily emphasized by the District Court, should be based on wholly erroneous and unsupported assumptions of fact.

Section 4888 R. S. Requires Only That a Patentee "Distinctly" Claim the Invention—Not That Each Claim Must be a Textbook on the Invention.

The statutory requirements governing patent specifications and claims are embodied in Section 4888 R. S. Stripped of language not here important, this statute reads:

"* * * (Before an inventor shall receive a patent he) * * * shall file in the Patent Office

(1) a written description of the same, and of the manner and process of making, constructing, compounding, and using it,

in such full, clear, concise, and exact terms as to enable any person skilled in the art * * * to make, * * * and use the same;

(2) and he shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery. * * *"

(R. S. Section 4888, 35 U. S. C. 33.)

This two-part statutory command is perfectly clear. There must be:

1. A specification enabling those skilled in the art to make the invention; and,

2. Claims "distinctly" pointing out the invention.

Nothing more is expressed in the Statute. No more can be here required.

The District Court misread the statute and imported to

the second statutory requirement the demands of the first. In particular, after quoting the statute, the District Court stated:

“If the inventor fails to include in his patent *claim* such a description, then the patent must be found to be invalid.” (R. 68.)

Under this test neither the Parker patent nor any other patent is valid. Claims drafted to meet the clear language of the statute, the requirements of the Patent Office, and the Court decisions, are necessarily invalid when the statute is misread as was done in the present case.

In fact, it is an established Patent Office rule that “prolix” claims are not allowable. See the Manual of Patent Examining Procedure, page 56.* The Courts have also held that the statute is not met by claims including too much as distinguished from too little of the invention. *Lincoln Engineering v. Stewart Warner*, 303 U. S. 545 (1938).

As we point out in the following sections, the Parker specification and claims fully meet the statutory requirements. The patent is accordingly valid.

There Is No Record Evidence That the Parker Specification Is Incomplete. Nothing Overcomes the Examiner’s Finding That the Specification Adequately Describes the Parker Coupling.

The District Court found that the Parker specification:

“* * * does not describe either the sleeve head angle or the differential angle” (Finding 7, R. 80).

This finding is clearly erroneous because the Record is wholly devoid of any supporting evidence.

The District Court opinion includes equally erroneous statements that in the

“* * * patent application, in describing the sleeve,

* Department of Commerce, U. S. Patent Office.

the plaintiff did not attempt to depict the angle of the 'sleeve head angle' or the angle of the 'differential angle' '' (R. 66),

and that

“* * * plaintiff did not in the patent application attempt to actually describe the flare ‘so shaped’ but after the use of the words ‘so shaped’ merely described what it would do. * * *” (R. 67.)

Again, the District Court, dwelling on its own confused analysis, asserted in justification of the decision that:

“* * * There is nothing in the patent application or in the claims to indicate just how the sleeve was to be so shaped. * * *” (R. 69.)

Yet the Court inconsistently admitted that the “drawings in themselves give the general shape and contour of the sleeve” (R. 69).

Judge Westover was correct in noting that the drawings give the “general shape and contour of the sleeve.” He failed to note, however, that the specification very carefully—and in considerable detail—refers to the drawings. The specification particularly explains, with respect to the general shape shown in the drawings, the specific features of patentability. For example, the sleeve head angle or taper on the sleeve is indicated at Figures 2 and 3 of the drawing (R. 1323) by the line d, and explained in the specification by reference to the line d (col. 2, lines 49-52, R. 1325). Similarly, the sleeve head angle is described in the specification (col. 2, lines 6-48, R. 1325) with specific reference to the lines b and c of the drawing (R. 1323).

The error of the findings on the specification is also shown by their complete lack of support in the record. Thirteen witnesses testified at the trial and by deposition, most of them expert aircraft engineers. Not one witness testified that he would have the slightest difficulty constructing a Parker coupling from the patent specification.

Moreover, the Patent Examiner allowed the Parker patent and in so doing found that the specification adequately and fully disclosed the invention as required by statute. If the presumption of patent validity has any meaning at all, it means that the Parker specification is adequate. Certainly a total absence of proofs cannot sustain a burden that is a "heavy one" and must overcome "every reasonable doubt" (*Mumm v. Jacob E. Decker & Sons*, 301 U. S. 168, 171 (1937)). As stated by Judge Learned Hand:

"* * * all patents are presumed to be operative when they pass the examiners, and there must be substantial proof that they are not, if they are to be disregarded. * * *" (*Western States Mach. Co. v. Hepworth*, 147 F. (2d) 345, 348 (1945).)

It should not be overlooked that the patent statutes require only that the specification describe "the best mode in which he (the inventor) has contemplated applying that principle" of the invention "so as to distinguish it from other inventions." (Section 4888 R. S., 35 U. S. C. 33.) Parker fully met this test. It is the only test that is applicable.

Each Claim of the Parker Patent "Particularly Points Out and Distinctly Claims" the Parker Invention. The Statute Requires Nothing More.

The District Court seized upon the words "so-shaped" in the Parker claims to hold them technically invalid (R. 67-74). The Court further held that the claims were "lacking in essential structural description" (Finding 14, R. 85).

This analysis, and the resultant findings, applies a false test to the claims. It obscures the decisive fact—namely, that the claims do point out, with particularity, the Parker inventive features. These features are the sleeve head angle (Claim 2), the differential angle (Claim 1), and the combination of the angles (Claim 3). There is no sugges-

tion anywhere in the record of this case that the claims cover any more than these features which were wholly new with Parker.

The sleeve head angle permits the sleeve (red) to flex under the clamp nut pressure (green) without engaging the bore of the clamp nut (green). This action is achieved by the cooperation of the clamp nut and the sleeve and not by the construction of either part alone.

Parker Claim 2, for example, very specifically points out that the "clamping shoulder" on the sleeve head be "spaced a distance back of the inner flare surface" and that the "outer surface of said head (of the sleeve, red) and the said inner wall of the coupling member (clamp nut, green) being so shaped relative to each other that when the sleeve head expands during the clamping action they will contact only in the region of the clamping shoulder" (R. 1326, col. 2, line 36).

There is nothing indefinite or misleading about this language. It points out, in technical terms but nevertheless clearly, that the shapes of the sleeve and the clamp nut coact to provide an increased radial clearance between the sleeve head and clamp nut as the toe of the sleeve is approached. This is precisely the sleeve head angle structure as will be evident from an examination of Chart 2 (page 9, this brief). Certainly this language "particularly points out" the invention in full compliance with the Statute since the invention (sleeve head angle) inheres in this arrangement of the parts.

The differential angle is likewise fully defined in Claim 1. The claim recites:

"* * * said head (the sleeve head) having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube,

whereby during the clamping action said head will be expanded and moved forward along the flared end of the tube into intimate contact with the outer surface thereof throughout substantially the entire extent of the flared surface on the sleeve head.” (R. 1326, col. 2, line 13.)

The Parker differential angle invention resides in arranging the sleeve (red) to engage the tip of the tubing flare (blue) to extrude the flare outwardly in mushroom fashion as the coupling is drawn tight. This is achieved by coaction of the sleeve with the other parts of the coupling. If the degree of bevel of the body member (yellow) is altered to accept a tubing flare having a corresponding degree of taper, the sleeve head (red) must have a new conformation to achieve the initial toe contact. It is not the taper of the interior of the sleeve, nor the taper of the tube flare that provides the differential angle—it is the difference between these tapers. The claim logically and very clearly recites this feature in terms of the coaction of these parts which give rise to this essential characteristic.

The acid test of this claim language is the evidence in this case. The Patent Examiner found that the claims were proper and issued the patent only because they fully met the statutory requirements. Any finding that the claims were improper must rest on evidence overcoming the finding of the Examiner. The present record is devoid of such evidence. Not a single witness testified that the Parker invention resides in something other than or different from the recitations of the claims. Like the findings on the specification, the District Court found the claims inadequate only by gratuitously assuming facts that are wholly absent in the record.

The Courts Have Uniformly Held That Claims Need Only Point Out the Invention—Not Redescribe It.

The standards applied to the Parker claims by the District Court are not only based upon a misreading of an unambiguous statute and upon evidence not in the record, but, in addition, these standards are irreconcilable with the judicial decisions. The authorities are unanimous that the claims are required only to point out the invention, not to redescribe it. The Supreme Court has stated:

“* * * it is not necessary to embrace in the claims or describe in the specifications all possible forms in which the claimed principle may be reduced to practice. It is enough that the principle claimed is exemplified by a written description of it and of the manner of using it ‘in such full clear, concise, and exact terms’ as will enable one ‘skilled in the art to make, construct, compound and use the same’.” (*Smith v. Snow*, 294 U. S. 1, 11 (1935).)

Moreover, in *Western States v. Hepworth*, 147 F. (2d) 345, 349 (C. A. 2, 1945), Judge Learned Hand observed:

“* * * All claims are to some extent more general than the specifications * * *.”

It is also settled law that the specification and drawings are to be construed together. As stated at 69 C. J. S. 701:

“The specifications and the claims of a patent constitute a contract between the United States and the patentee, and they should be read and construed together in order to determine the real meaning of the claims and for the purpose of ascertaining from the entire agreement the actual intention of the parties
* * *.”

Also, in *Payne Furnace & Supply Co., Inc. v. Williams-Wallace Co.*, 117 F. (2d) 823, 828 (1941), this Court stated:

“* * * The argument would require us to close our eyes entirely to the drawings and specifications of the patent. These have an explanatory or interpretative office not to be ignored. The patent discloses the

inventor's conception of a composite pipe adopted—and manifestly intended—to be put together section on section to form a complete flue pipe. The drawings and specifications elucidate the claims in this respect so that no fair doubt remains concerning the nature and object of the combination invented.”

There is nothing difficult or ambiguous about the claim language. However, if there is some question, it can be fully answered by reference to the specification and drawing, which, even to the uninitiated, give a full and complete description of the Parker contributions to the art.

The Patent Examiner was right when he found that the Parker claims comply with the statute and decided cases.

The opinion of the District Court emphasizes the principle that a patent “illustration cannot enlarge the claims” (R. 69). This generality is sound law, but is wholly inapplicable here. We only seek to enforce the Parker claims as they are written and, if necessary, to refer to the specification and drawings to explain the claim terminology and **limit**, not enlarge, the scope of the claims. This has been universally approved by the courts. *Charles Peckat Mfg. Co. v. Jacobs*, 178 F. (2d) 794, 798-9 (C. A. 7, 1949).

The District Court raised a non-existent issue in declaring that “No one, taking the patent **and not using the illustrations**, could make the sleeve in question ‘so shaped’ that it would produce the results claimed for it, without independent experimentation” (R. 70). Of course not. The illustrations of the patent are there for the very purpose of showing the nature of the invention. The illustrations of a patent can no more be disregarded in determining the nature of an invention than metes and bounds can be ignored in determining the effect of a deed. It is classic patent law that the illustrations are part of the written specification and are to be considered with the

specification in determining the nature of the invention. *Shull Perforating Co. Inc. v. Cavins*, 94 F. (2d) 357, 364 (C. A. 9, 1938); *Payne Furnace & Supply Co. v. Williams-Wallace Co.*, 117 F. (2d) 823, 825 (C. A. 9, 1941).

The error is compounded by the fact that this non-existent issue is decided upon non-existent evidence, gratuitously injected by the Court, that experiments are required to make a coupling utilizing the Parker invention. There is not and cannot be any such testimony for the patent embodies a full disclosure.

The Parker claims point out the invention. The specification fully discloses the invention. Nothing more is or can be required.

Without Exception, the Decided Cases Hold That Claims Like Parker's Are Proper.

The Parker patent specification fully describes and illustrates the Parker fitting and the operation of the sleeve head angle and the differential angle. It is perfectly evident from the patent itself that these two features are obtained by relatively proportioning the clamp nut, sleeve, and other parts to achieve the necessary bearing and clearance areas. As the claims express it, the parts must be "so-shaped" as to effect these characteristics.

The courts have uniformly upheld this type of patent as meeting the requirements of the statutes. The Patent Office, following the plain statutory language and these uniform cases, has systematically granted such patents. In fact, the Examiner of the Parker application was most careful in this respect and, after finding that the original claims did not meet the statute, he reconsidered and allowed the claims now in the patent (R. 1441, 1457). This is not a case where the Examiner overlooked a crucial matter of inquiry. Nothing "slipped by".

An illustrative case involving a situation of the present kind is found in *Schreyer v. Chicago Motocoil Corp.*, 118 F. (2d) 852 (C. A. 7, 1941). There the invention lay in positioning a layer of metal wool in a steam duct to prevent water surges. The specification showed one arrangement for doing this and explained the mode of operation, but did not give dimensions or other design details required for application of the invention to a specific problem. In particular, no specific thickness values were given for the wool layer nor were all the possible positions of the layer described.

The patent claims recited, like the Parker claims, "a layer of metal wool of sufficient thickness and so positioned" as to prevent surging of water into a steam duct during normal use. The court held this to be in full compliance with the statute, stating:

"* * * To be sure, the exact thickness of the layer is not designated, but it is to be of such thickness as to prevent surging of the water into the steam duct during normal use. To a lay mind this would mean that the thickness of the layer should be determined by trial and error and we think one skilled in the art would so consider it, and have no difficulty in producing the disclosure."

The classic case of *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U. S. 405, 419 (1909), upheld the validity of claims using exceedingly broad expressions such as "means for operating said fingers at definite times," and other recitations of function. This case, erroneously quoted by the District Court for a non-existent statement (R. 70), supports Plaintiff's position that the Parker claims are well within the requirements of the statute. The decision below cannot be reconciled with the *Paper Bag* case.

This Court in *Cutter Laboratories v. Lyophile-Cryochem*

Corp., 179 F. (2d) 80, 87 (1949) squarely held that the words “substantially instantaneous freezing” met the requirement of the patent statutes as to claim language. Of course, this phrase did not tell how fast the freezing must be in terms of minutes or seconds any more than the words “so-shaped” defined the precise values of the sleeve head and differential angles in terms of degrees of arc. In each case, however, the claim, when construed in the light of the specification, fully describes what is patented—all that is required.

The *Cutter* case is nowhere cited or mentioned in the opinion of the District Court in the present case.

The Incandescent Lamp Case, Erroneously and Gratuitously Relied Upon Below, Is Wholly Irrelevant to Any Issue of This Case.

The District Court relied more heavily on the *Incandescent Lamp* case, 159 U. S. 465 (1895) than on any other decision. Yet this case was not cited by Defendants and nowhere represented by them as even relevant to the issues here. The *Lamp* case is not only irrelevant here, but its place in the opinion below reveals the illogical consequences of the initial misconstruction of patent statutes indulged in by the District Court.

The *Lamp* case was the consequence of an effort, by filing a broad and wholly impractical patent disclosure, to monopolize all future developments in incandescent lamps. The claims of the Sawyer and Mann Patent there in suit called for a lamp filament “of carbonized fibrous or textile material,” thus encompassing the entire gamut of carbonized (burnt) filaments. The patentees had actually tried only a very few materials and those that had been tried were commercially impractical.

Long after the Incandescent Lamp patent, Thomas Edi-

son undertook to develop what Sawyer and Mann sought and failed to achieve—a practical incandescent lamp. He was forced to try some 6000 filament materials from all over the world, most of them being within the scope of the very broad claim language of the Sawyer and Mann Patent. Yet only a very few of these materials were operable and still fewer were practical. None of the materials described in the Sawyer and Mann patent were new materials Edison found to be practical or materials used in the accused lamps.

The Supreme Court properly held that the Sawyer and Mann Patent could not be construed to cover what Edison contributed rather than the contribution of Sawyer and Mann. Since the claims of the patent were so broad and indefinite that they covered, not what the inventors did, but what Edison did, the Court properly found that the claims did not meet the statutory requirement of “particularly pointing out the invention”.

This Court properly distinguished the *Incandescent Lamp* case in *Snow v. Kellar-Thomason Co.*, 241 Fed. 119, 120 (1917) where, as here, the claims covered the invention made by the patentee and no other.

The *Lamp* case is wholly inapplicable here. The present record is devoid of the proofs that were crucial in the *Lamp* case. There is no testimony whatsoever in the present record that structures conforming to the Parker claims do not embody Parker’s contribution. There is no showing of any kind that the Defendants obtained the coupling designs independently. In fact, Masters himself testified that he “filched” the Parker drawings, and that Parker “was the father” of the couplings here accused (R. 639), an admission that alone makes the *Lamp* case inapplicable.

The Parts of the Parker Patent Structure Coact in a New Manner to Form a New Combination Not Shown in the Prior Art. *Halliburton v. Walker* Is Inapplicable.

The point of novelty of the Parker patent structure here in suit lies in the use of a sleeve which, in cooperation with the other coupling elements, gives rise to the sleeve head angle and the differential angle. These are nowhere to be found in the prior art. The Patent Examiner found them new and patentable.

The Parker invention resides in a new arrangement and design of the elements of the coupling—not in adding a specific new element to the prior art coupling. Parker's invention resides in a new coaction of the parts and a new patentable combination of elements.

The District Court wholly overlooked this crucial fact when it classified this case with *Halliburton v. Walker*, 329 U. S. 1 (1946). There the Supreme Court held patent claims fatally defective because the novelty lay in adding a specific known element to an old combination of elements used to measure the depth of an oil well. That additional old element, appended to the prior art system, was not recited by its structure, but merely as a "means" to perform the additional function, a recitation that necessarily and inherently covered far more than Walker ever contributed to the art since he contributed neither the combination nor the element.

In the present case Parker contributed a new combination. Every element of that combination—the body, the clamp nut, and the sleeve—is found in some form in the prior art. There is no question here with respect to reciting an additional element because no additional element is present.

The Parker patent does not have the defect of the

Walker patent—it cannot do so because the essential ingredient of an additional element is wholly absent.

As if to answer the *Halliburton* contention in advance, the Supreme Court in *Faulkner v. Gibbs*, 338 U. S. 267 (1949), affirming this Court, held that the *Halliburton* decision does not apply where the invention lies “in the fact of the combination” and not “in the novelty of any particular element.”

Faulkner v. Gibbs was wholly ignored in the opinion below. Yet it wholly disposes of the *Halliburton* case.

The District Court also completely ignored this Court’s decision in *Cutter Laboratories v. Lyophile-Cryochem Corp.*, 179 F. (2d) 80, 91 (1949), where claims were held valid even though they were in terms of result. In that case, as here, the invention lay in a new combination rather than an added element appended to an old combination.

The Claim in *General Electric v. Wabash* Was Merely to a Result. The Parker Patent Claims Structure. General Electric Does Not Apply.

The District Court relied on *General Electric v. Wabash*, 304 U. S. 364 (1938), to support its holding that the Parker claims are indefinite. Yet the *General Electric* case is wholly unlike the present case.

In *General Electric v. Wabash*, the patentee had discovered, after some 218 experiments, that if an alkaline silicate is brought into intimate association with the tungsten filament of an electric lamp, undesirable grain growth is prevented. But the patent claims did not cover this invention—they sought to encompass *all* methods of preventing grain growth in filaments. This was done by claiming a filament:

“* * * made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging or offsetting * * *.”

The Parker invention lies in utilizing the sleeve head angle and the differential angle in a coupling otherwise similar to the prior art. These are completely recited in the claims by structure and not in terms of mere result. For example, Claim 1, covering the differential angle, states:

“* * * said head having the inner surface thereof provided with a coniform flare so shaped that the initial contact of the head with the flared end of the tube is at the free end of the head and adjacent the outer end of the flared end of the tube * * *.” (R. 1326, col. 2, lines 12-17.)

This is a clear and precise recitation, not only of the presence of the coniform flare, but of its conformation. There must be a flare in the sleeve and that flare must first engage the tube at its outer extremity. Even an unskilled mechanic requires nothing more to construct the invention, especially after examining Figure 2 of the patent (R. 1323). Any structure within the scope of this language necessarily embodies Parker's contribution and nothing more.

The decisive fact of the *General Electric* case is that there a patent claim sought to cover more than the inventor contributed. That fact is absent here. *General Electric* cannot apply.

Conclusion On Claim Language.

The District Court committed basic error in misconstruing the plain language of the patent statutes to import into the claims the same requirements of description as are prescribed for a specification. This error permeates the entire decision and resulted in wholly unjustified reliance on cases such as the *Incandescent Lamp* case.

The Parker specification adequately tells those in the art how to construct couplings embodying the invention. The claims specify couplings embodying that invention and no other couplings.

By every test of the patent statutes, and by every test of the decided cases, the Parker specification and claims are proper.

There is no testimony to overcome the Examiner's finding that the Parker specification and claims are adequate.

ARGUMENT ON INFRINGEMENT.

The issue of infringement was not passed upon below (R. 87). However, since the record evidence forms a complete basis to pass on this issue, this Court can now find infringement and avoid further proceedings with respect to this question.

Each and Every Element of the Parker Claims Finds Response in the Accused Structures.

The witness Wolfram gave the basic testimony on infringement in this case. He read the Parker claims on each type of accused coupling, using the charts, Plaintiff's Exhibits 53, 58 and 59 (R. 1385, 1390, 1391) for reference (R. 301-362).

The claim charts are reproduced opposite the back cover of this brief, with coloring added to show the correspondence of the coupling parts to those previously discussed in this brief. With respect to the fittings of size 8 and larger, the sleeve head angle is present but not the differential angle. These fittings are charged only as infringements of Parker Claim 2 as shown in chart 6.*

The size 2 to size 6 fittings embody both the sleeve head angle and the differential angle. These fittings respond to all the Parker claims, as shown by chart 7, opposite the back cover of this brief.**

* Since the Collins and Masters fittings are identical, we reproduce here only the Masters chart (Plaintiff's Exhibit 58, R. 1390).

** Plaintiff's Exhibit 53, R. 1385.

We assume that Defendants do not seriously question the fact that they make and sell complete 3-piece tube couplings. There can be no such question in view of their repeated counterclaim allegations that:

“* * * Defendant is the manufacturer of a **tube coupling** for use on flared tubing consisting of a body, a nut, and a sleeve * * *” (R. 47) (see also paragraphs 32 and 33 of the counterclaims, R. 50-51).

Any possible doubt that the accused couplings embody the Parker invention is resolved by the testimony of Masters who stated that he did no development whatsoever in connection with the fitting (R. 667); that Parker was the “father” of the fitting (R. 638-9); and that he “filched” the Parker drawings (R. 639). Having taken Parker’s drawings, there can be little doubt that Masters took the Parker fitting as well.

Every Parker claim recitation finds response in the accused couplings. There is infringement.

CONCLUSION.

The urgent need for millions of couplings during the war, due to insistence by the Armed Forces on the use of Parker couplings, prompted Parker, in a spirit of patriotism, to make its technology freely available to the industry. As a result, the Defendants obtained access to the Parker drawings and were able to enter the coupling business. Defendants recognize the significance of Parker’s contributions by admitting that their structures stem from Parker and not from the prior art or their own research. Yet they call upon this Court to ignore the importance of these contributions to relieve them of patent responsibility. This double standard is not available.

Parker contributed the sleeve head angle and differential angle to the art of tube couplings. Couplings utilizing these contributions have wholly displaced all previous

couplings in the aircraft industry, where considerations as to weight and size are critical and yet reliable performance at enormous pressures and under adverse conditions of maintenance and installation must be achieved.

These facts, ignored by the District Court and yet uncontradicted on the record, spell invention of high order. The holding of non-invention is clearly erroneous.

Moreover, Parker fully complied with Section 4888 R. S., both as to his specification and as to his claims. The decisions of the courts and the action of the Patent Examiner in the Parker application fully support the technical adequacy of the Parker patent. The decision below—that Parker did not comply with the statute—stands alone. It must, as it is based on a misconstruction of the statutory language that is irreconcilable with a plain reading of the words. The holding that Parker's specification and claims are technically insufficient is likewise reversible error.

The issue of infringement, not passed upon below, is completely resolved by application of the Parker claims to the accused structures—application that leads only to the conclusion that the accused structures constitute a complete response to the claims and hence an infringement.

The Parker patent is valid. It is infringed.

Respectfully submitted,

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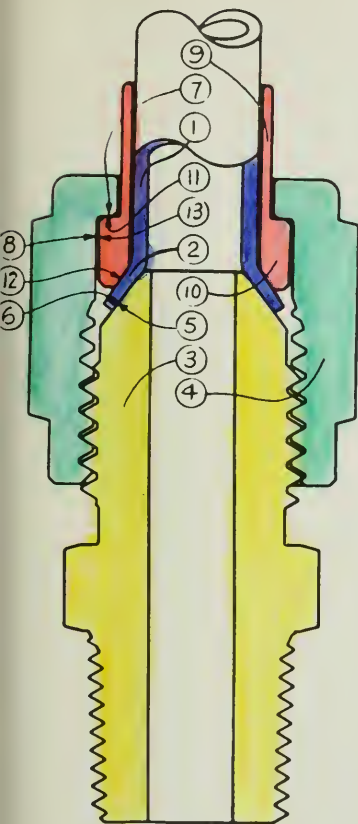
MASTERS FITTING

with single angle sleeve

Aug. 20, 1940.

A L PARKER
TUBE COUPLING

2,212,183



CLAIM 2. In a coupling for (1) tubes having the (2) ends thereof flared, (3) (4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith for engaging the (6) inner flare of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder and (8) an inner wall, (9) a sleeve surrounding said tube and having a (10) solid head capable of radial expansion during the clamping action, said (10) head being provided with a (11) clamping shoulder against which the (7) shoulder of the coupling member engages and an (12) inner flare surface for engaging the outer (2) flared end of the (1) tube, said (11) clamping shoulder being spaced a distance back of the (12) inner flare surface, the (13) outer surface of said (10) head and the said (8) inner wall of the (4) coupling member being so shaped relative to each other that when the sleeve (10) head expands during the clamping action they will contact only in the region of the (11) clamping shoulder, the remaining portion of the (10) head being free from contact with the (4) coupling member whereby the clamping force of the (10) head against the (1) tube is determined by the spring tension of the metal forming said (10) head.

Chart 6 -- The "Single Angle" Sleeve Couplings (Sizes 8 to 48)
Utilize the Sleeve Head Angle and Embody a Full Response To
Parker Claim 2.

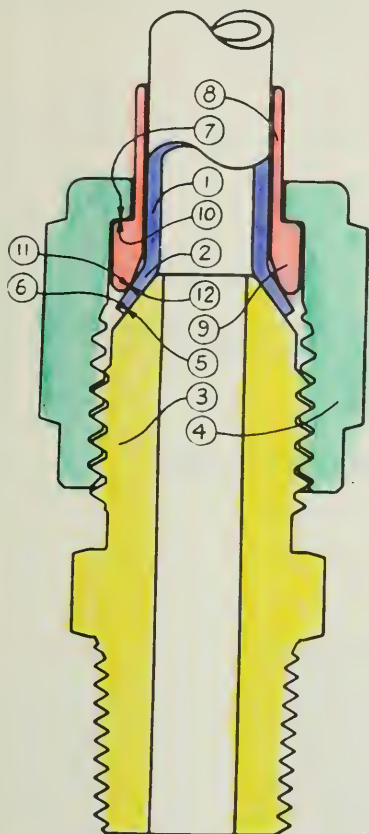


MASTERS FITTING with double angle sleeve

Aug. 20, 1940.

A L PARKER
TUBE COUPLING

2,212,183



CLAIM 1. In a coupling for (1) tubes having the (2) ends thereof flared, (3)(4) coupling members having threaded engagement with each other, (3) one of said coupling members having a (5) seat associated therewith adapted to engage the (6) inner face of the (2) flared end of the (1) tube and the (4) other coupling member having a (7) clamping shoulder, a (8) sleeve surrounding said (1) tube and having a (9) solid head provided with a (10) shoulder against which the (7) clamping shoulder of the (4) coupling member engages, said (9) head having the (11) inner surface thereof provided with a coniform flare so shaped that the initial contact of the (9) head with the (2) flared end of the (1) tube is at the free end of the (9) head and adjacent the outer end of the (2) flared end of the (1) tube, whereby during the clamping action said (9) head will be expanded and moved forward along the (2) flared end of the (1) tube into intimate contact with the (12) outer surface thereof throughout substantially the entire extent of the (11) flared surface on the sleeve (9) head.

Chart 7 -- The "Double Angle" Sleeve Couplings (Sizes 2 to 6)
Embody Both the Sleeve Head Angle and the Differential Angle.
They Fully Respond To Parker Claim 1 As Well As Claims 2 and 3.

